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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,493	09/02/2003	Yun Soo Choe	0096.1035	2730

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STEIN MCEWEN, LLP  
1400 EYE STREET, NW  
SUITE 300  
WASHINGTON, DC 20005

EXAMINER
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PAIK, SANG YEOP

ART UNIT	PAPER NUMBER
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3742

NOTIFICATION DATE	DELIVERY MODE
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07/08/2010

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptomail@smiplaw.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/652,493	<b>Applicant(s)</b> CHOE ET AL.	
	<b>Examiner</b> SANG Y. PAIK	<b>Art Unit</b> 3742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 7-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 28 is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-27 and 29-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/5/10</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 4, 9, 11-13, 16-18, 21-24 and 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow (US 5,157,240) in view of Chandler (US 2,799,764) or Isaacson et al (US 3,842,241), and Yamashita et al (US 5,034,200) or Fassell (US 3,811,900).

Chow shows a heating crucible having a main body container, a cover formed of an insulating material such as the nitride ceramic with a nozzle, one or more heating elements as a cover heater formed as a thin film via chemical vapor deposition on a top surface of the cover, facing away from a main body, wherein one heating element would form a single layer heater, a body heater for heating the main body, the cover heater having a wire pattern formed over the entire top surface of the cover with the positive and negative thermals, a thermocouple in the cover, a heat-resistant layer (25') on the cover heater, the main body also formed of an insulating material such as the nitride ceramic with a body heater as a thin film on the outer wall of the main body, a heat resistant layer (25) made of pyrolytic boron nitride on the body heater, the body heater having a single wire pattern with the positive and negative terminals, and a

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thermocouple inside the main body. However, Chow does not show a heat reflective layer between the heater and the heat-resistant layer.

Chandler or Isaacson shows that it is well known in the art to provide a heating device having a heating element provided with a heat reflective layer to direct the heat toward the desired heating surface. In Chandler, it is shown that the heating element (72) is provided on a heating surface (76) with a heat reflecting layer (62) disposed between the heating element and a heat resistant/insulating layer (78). Isaacson also shows a heating surface (14) upon which a heating element (50) provided thereto with a heat reflective layer (56) disposed between the heating element and a heat resistant layer (40).

Yamashita and Fassell are provided to show that the layer (25) made of pyrolytic boron nitride in Chow is well known in the art to be heat-resistant.

In view of Chandler or Isaacson, and Yamashita or Fassell, it would have been obvious to one of ordinary skill in the art to adapt Chow with a reflective layer provided between the heat resistant layer and the heater to reflect the heat generated by the heater toward an intended heating direction.

With respect to claim 9, Chow shows the cover having a nozzle in the center of the cover with a cover heater provided around the nozzle. However, while, Chow does not show that the cove heater concentric pattern around the nozzle, it would have been obvious to one of ordinary skill in the art to provide the cover heater in the concentric pattern or any other pattern to affectively provide uniform and stable heating across the cover.

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With respect to the method by which the heating element or block is provided on the cover and how such is formed, it is noted that the pending claims are apparatus or product and such is defined by the product itself and not by the process it is produced.

3. Claims 3, 14 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson and Yamashita or Fassell as applied to claims 1, 2, 4, 9, 11-13, 16-18, 21-24 and 29-31 above, and further in view of Kano et al (US 6,242,719).

Chow in view of Chandler or Isaacson and Yamashita or Fassell shows the heating crucible claimed except the cover heater being platinum.

Kano shows a heating element such as platinum or graphite deposited or printed via the chemical vapor deposition on an insulating ceramic layer such as pyrolytic boron nitride or aluminum nitride. In view of Kano, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson and Yamashita or Fassell, with the cover heater made of platinum as an alternative conductive material that can alternatively provide stable and uniform heating temperature, and with respect to claim 14, it would have been obvious to further provide insulating material made of aluminum nitride that alternatively provide a good electrical and thermally conductive material.

4. Claims 7, 8, 15, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson and Yamashita or Fassell as applied to claims 1, 2, 4, 9, 11-13, 16-18, 21-24 and 29-31 above, and further in view Kawase (US 5,656,077) or Tanabe et al (US 6,296,894).

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Chow in view of Chandler or Isaacson and Yamashita or Fassell shows the heating crucible claimed except the cover or the main body is made of aluminum nitride or alumina.

Kawase or Tanabe shows a crucible that is made of pyrolytic boron nitride as well as aluminum nitride or alumina. Kawase further shows the crucible that is made of silicon carbide.

In view of Kawase or Tanabe, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson and Yamashita or Fassell, with the cover and the main body made of aluminum nitride, alumina or silicon carbide in place of the pyrolytic boron nitride since such is well known in the art to alternatively provide a mechanically and thermally stable body that can withstand a temperature, pressure and chemical stress.

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson and Yamashita or Fassell as applied to claims 1, 2, 4, 9, 11-13, 16-18, 21-24 and 29-31 above, and further in view Okuda et al (US 4,804,823).

Chow in view of Chandler or Isaacson and Yamashita or Fassell shows the heating crucible claimed except the cover heater is made of conductive paste with metal particles and metal oxides.

Okuda show that it is known in the art to provide a conductive paste made with metal particles or metal oxides applied to a ceramic substrate to form a sintered electrical heater. In view of Okuda, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson and Yamashita or Fassell,

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with the cover heater made of conductive paste having the metal particles and metal oxides to form a heating element that can provide a mechanically and thermally stable heater that can also withstand a high temperature.

6. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson and Yamashita or Fassell as applied to claims 1, 2, 4, 9, 11-13, 16-18, 21-24 and 29-31 above, and further in view Takagi (US 4,217,855).

Chow in view of Chandler or Isaacson and Yamashita or Fassell shows the heating crucible claimed except on the entire outer bottom wall of the main body.

Takagi shows a heating crucible having a main body wherein the heating element is provided along the entire body including the bottom wall of the crucible (see Figure 8).

In view of Takagi, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson and Yamashita or Fassell, with the crucible having the bottom wall with the heating element formed on the entire surface as an alternative form to efficiently and adequately heat the content of the crucible.

7. Claim 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson and Yamashita or Fassell as applied to claims 1, 2, 4, 9, 11-13, 16-18, 21-24 and 29-31 above, and further in view Chen et al (US 6,024,799) or Murakami et al (US 5,728,223).

Chow in view of Chandler or Isaacson and Yamashita or Fassell shows the heating crucible claimed except the nozzle having a convergent-divergent nozzle.

Chen and Murakami show that it is well known in the art to provide the gaseous outlet nozzle with a convergent-divergent nozzle that is flush with the gas outlet surface cover. In view of Chen or Murakami, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson and Yamashita or Fassell, with the nozzle having a convergent-divergent nozzle to provide a more defined outlet gas flow for even distribution of the vapor deposition.

***Allowable Subject Matter***

8. Claim 28 is allowed is allowed over prior art of record.

***Response to Arguments***

9. Applicant's arguments filed 4/1/10 have been fully considered but they are not persuasive. The applicant argues the additionally applied Yamashita and Fassell which teach for the pyrolytic boron nitride being a heat resistant are in direct contradiction to the reasoned opinion of the Board of Patent Appeals and Interferences of August 3, 2009 and that even assuming the pyrolytic boron nitride has heat resistant properties within a reasonable interpretation of claim 1, the resultant crucible would be inoperable for its intended purpose. This argument is not deemed persuasive. It is noted that the board opinion is based on the assumption that the protective layer 25 of Chow does not impeded a heat transfer because it is assumed that pyrolytic boron nitride is not a heat transfer layer. With the newly applied Yamashita and Fassell which shows the pyrolytic boron nitride being a heat resistant layer, the board's opinion doe not need to be on a supposed assumption. Furthermore, the applicant describes a heat resistant as a thin film type (para 37 on page 7) and nothing more is described. Thus, interpreting the



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recited heat resistant layer in light of the applicant's own disclosure, the protective layer  
25 made of pyrolytic boron nitride of Chow being a thin layer meets the recited heat resistant layer as described by the applicant's own description and the teaching of Yamashita and Fassell further supports that a pyrolytic boron nitride can be described as a heat resistant layer. Also, the resultant crucible as stated by the applicant would be the crucible of Chow having a pyrolytic boron nitride and its intended purpose remains the same and is not in anyway contradictory the board's reason since the board's supposed assumption is now moot in light of Yamashita and Fassell.

The applied prior art meets the recited structure and there is no other claimed structure that distinguishes the claimed invention over that of the applied art.

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sang Y. Paik whose telephone number is 571-272-4783. The examiner can normally be reached on M-F (9:00-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tu Hoang can be reached on 571-272-4780. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SANG Y PAIK/

Sang Y Paik

Primary Examiner, Art Unit 3742

Primary Examiner

Art Unit 3742

syp